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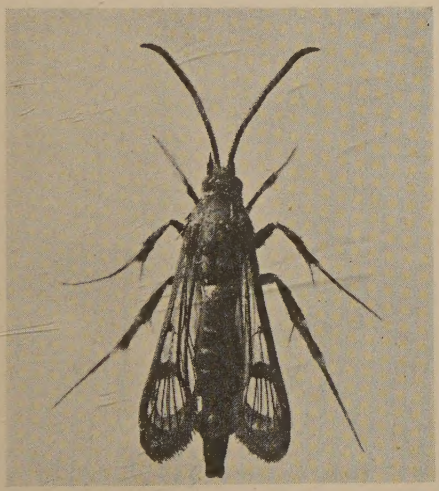
Control of the Western Peach and Prune Root-Borer



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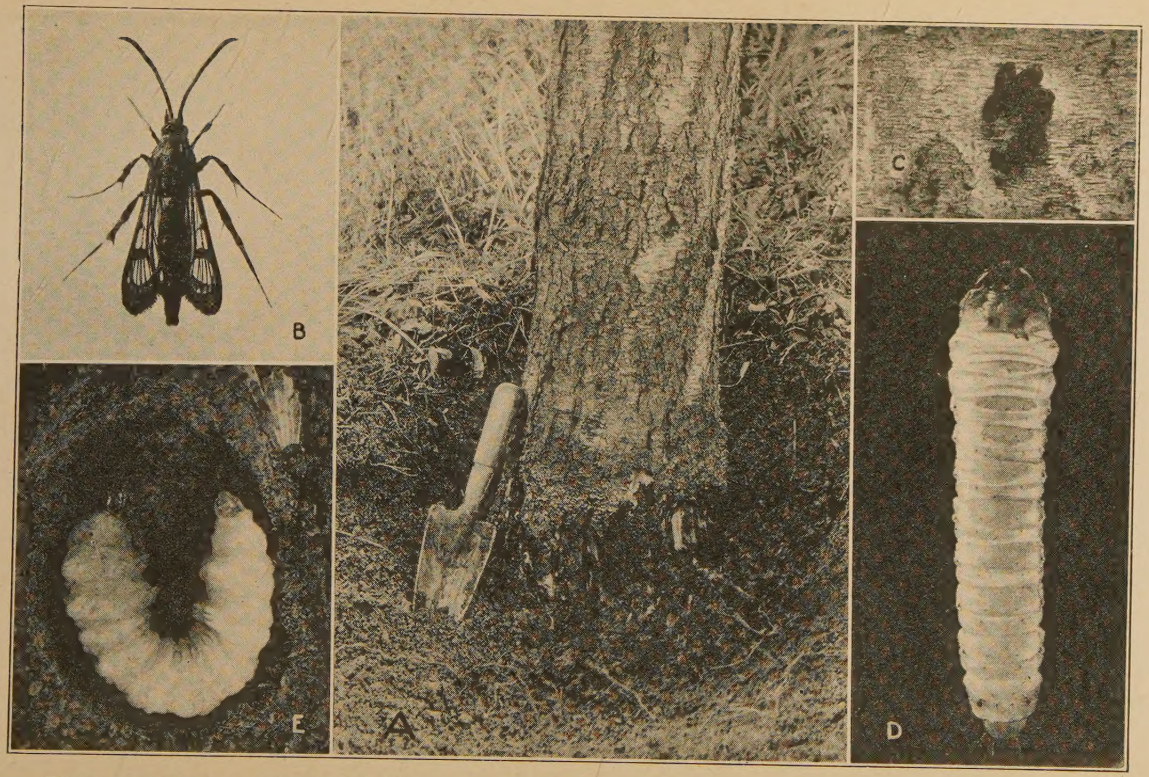

Figure 1. A: Peach tree practically girdled by continual attacks of the root borers. B: Adult moth, at rest. C: Eggs on prune bark (magnified). D: Larva (magnified). E: Larva in winter cell (magnified).

Control of the Western Peach and Prune Root-Borer*

By Don C. Mote, Entomologist

THE Peach and Prune Root-Borer, one of the worst insect enemies of the peach and prune, can be easily and cheaply controlled by the use of paradichlorobenzene.† This conclusion may be drawn from the experimental work conducted by the Oregon Agricultural Experiment Station. When applied in early fall with soil temperatures high (above 55° F.) and soil moisture low, paradichlorobenzene will kill 90 per cent or more of the borers. A kill of 65 to 100 per cent is reported by the prune growers and county agricultural agents who have used this material.

Paradichlorobenzene. Chemically pure paradichlorobenzene is a white crystalline solid which gives off gas slowly at ordinary temperatures. To obtain the best results in borer control the crystals of paradichlorobenzene should be dry and fine enough to pass through a screen ten meshes to the linear inch. These small crystals, when exposed in the soil to a temperature of 60° F., or above, change to a gas which penetrates the burrows of the borers. This gas is decidedly poisonous to the borers when they are exposed to it for a considerable period of time. Man and domestic animals are not injured except by prolonged exposure or by taking the crystals internally.

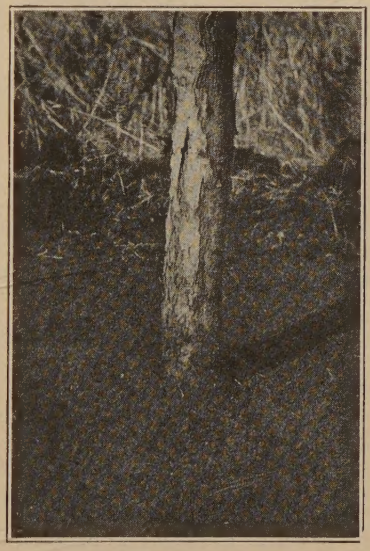

Figure 2. Prune tree showing soil at base leveled, ready for application of Paradichlorobenzene.

Method of application. Level off the surface of the soil about the base of the tree, but avoid disturbing the soil below the surface. Remove all large masses of gum that may be present at the base of the tree. Having prepared the soil, proceed to sprinkle the finely ground crystals in a ring around the base of the tree. This should form a circle about one inch wide and about two inches distant from the tree trunk. This part of the treatment should be done carefully. If the material is placed too far from the base of the tree the toxic effect

* *Sanninoidea apalescens* Edw.

† Several abbreviated terms for this word have been suggested such as P. C. benzene, P. D. B. (Painless Death to Borers).

of the gas is greatly lessened. On the other hand if it is placed too near, injury to the tree is likely to result.

As soon as the paradichlorobenzene has been properly distributed around the tree, it should be carefully covered with a few shovelfuls of loose earth, and the mound so formed should be well packed over the material. The first shovelful of earth pleaced above the "death ring" should be finely divided and carefully placed on top of the crystals in order that the position of the crystals will not be disturbed.

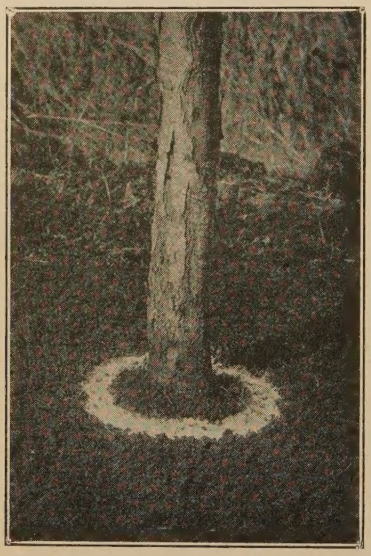

Figure 3. Prune tree showing the ring of Paradichlorobenzene in place.

Time of application. The most satisfactory time to make the application of paradichlorobenzene is from August 15 to September 15. It is desirable to delay the treatment to as late a date as weather conditions permit in order to avoid reinfestation from moths that may be flying and to allow the worms to collect about the crown of the tree. A sufficient time must be allowed, however, for the gas to act before unfavorable weather conditions set in. **If this treatment is to be effective the soil temperature must be 55° F. or higher for a period of ten days or more after the material is applied, and the soil must be reasonably dry during this time.**

Fall applications are most effective, but if these have been neglected or were improperly timed, a spring application is of value. Spring applications should be given as soon as the ground begins to warm up, the exact time differing with the locality. In the Willamette Valley, favorable weather and soil conditions for spring treatment usually occur early in May.

Dosage. From three fourths to one ounce of the paradichlorobenzene is sufficient for an ordinary tree 6 years of age and older. For trees 4 to 5 years old three fourths ounce, and for trees 1 to 3 years old one half ounce is used. A measure holding exactly the required amount is convenient for use in the orchard.

Injury to trees. Trees 4 years old and more have shown no ill effects from the treatment. Even on trees 1, 2, and 3 years old no injury has been observed by the writer or reported by county agricultural agents and growers in Oregon. If unusually low temperatures prevail, or if frequent rains keep the soil wet, the evaporation of the chemical may be considerably retarded. Under such conditions, especially on younger trees, it is desirable to tear down the mounds after from four to six weeks in order to prevent injury that might result from prolonged exposure to the fumes

of the chemical. The mounds are torn down in late fall, just before winter sets in, and fresh earth should be placed around the tree to prevent winter injury.

Borers above ground level not killed. The application of paradichlorobenzene will kill only the borers situated below the level of the mound. Because of the fact that the western prune root-borer displays a tendency to work high up on the trunks of the trees, some growers have adopted the plan of raising the soil level around the tree several inches before applying the "death ring" of crystals. This plan may be effective for the borers working in the tree several inches above the soil level. Paradichlorobenzene is, of course, not effective against those borers working high upon the trunks and branches. Furthermore, it has been observed that flatheaded borers located beneath the level of the mound containing the crystals have not been killed.

Prune borer spends winter in "grub" stage. The prune borers spend the winter in the "grub" stage in their tunnels in the bark or in the gum and frass as well as in the soil immediately surrounding the base of the tree. Many of these "worms" lie dormant in silken cells which they spin against the tree trunk beneath the soil surface.

With the approach of spring, the oldest borers leave their tunnels and spin cocoons in silken frass. Cocoons have been found at Roseburg as early as April 22, but they occur in greatest numbers in late May and early June.

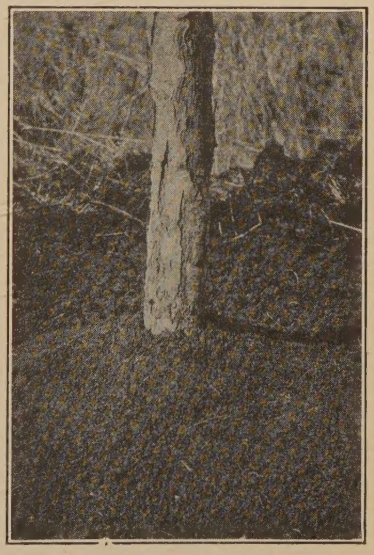

Figure 4. Prune tree with the soil mounded and packed over the paradichlorobenzene.

Adult moths are present in orchard throughout the summer. Dark steel blue, clear-winged moths with a wing expanse slightly more than an inch are observed in the orchard during the late half of June. These moths are active by day and have much the appearance of dark-colored wasps as they fly rapidly back and forth through the orchard. The greatest number of moths appear during July, but they continue to emerge and lay eggs throughout the summer.

The females begin laying eggs about July 1 with the heaviest egg laying occurring during the middle of the month. The number of eggs laid decreases from the middle of July until early fall when egg laying ceases.

The egg is a tiny flattened oval disc-shaped object of a deep chocolate brown color. The eggs are ordinarily laid on the trunks of the trees, most commonly within twelve inches of the ground. Each female is capable of laying from three hundred to eight hundred eggs.

The larvae tunnel in the bark and cambium. The eggs hatch within ten days, when the young larva gnaws its way through the eggshell and seeks entrance into the tree. When the tiny borer finds a suitable place in the bark it tunnels in and a small pile of frass marks the point of entrance.

The young borer lives for awhile in the outer layers of bark, leaving a tortuous tunnel of indefinite length and direction. When the larva grows larger it burrows deeper into the bark, forming the comparatively larger cavities in the inner bark and cambium which constitute the characteristic injury chiefly of the crown and roots.

The larva is a grub-like "worm," pale yellowish or white in color, with a dark brown head. When fully developed, the larva is approximately an inch and a quarter in length.

A single generation. Because of the long period of egg laying, larvae of all sizes may be found within the tree at almost any season. This gives the insect the appearance of passing through several generations during the year. Such is not the case, however, and there is but a single generation.

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